UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 5853

CSAH NO. 52

OVER THE

THE SOUTH BRANCH OF THE BUFFALO RIVER

DISTRICT 4 - CLAY COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 50)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 5853, Piers 1 and 2 and the North and South Abutments, were in good condition below water with no defects of structural significance observed. A light accumulation of timber debris was observed at Pier 2. The channel bottom appeared to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) The concrete piers and abutments were in good condition. Both abutments displayed minor vertical and diagonal cracks at random locations, ranging in width from hairline to 1/8 inch.

(B) A light accumulation of 6-inch-diameter and smaller branchy timber debris was observed at the upstream side of the upstream column at Pier 2.

(C) Abandoned concrete columns (two total) were observed in the channel 8 feet north of the South Abutment. The columns were removed below the channel bottom; however, the rebar from the columns extended from the bottom up to 1 foot above the waterline.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 5853

Feature Crossed: The South Branch of the Buffalo River

Feature Carried: CSAH No. 52

Location: District 4 - Clay County

Bridge Description: The superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete piers and two reinforced concrete abutments. The piers are numbered 1 and 2 starting from the south end of the bridge. No design plans were available.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John Loftus, Valerie Roustan

Date: August 21, 2007

Weather Conditions: Cloudy, ± 70ºF

Underwater Visibility: ± 1 foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2, North and South Abutments.

General Shape: The piers consist of two circular concrete shafts supporting a common out pier cap. The abutments consist of concrete vertical walls with adjacent skewed wingwalls. It is not known if the piers and abutments are supported on piles, due to the unavailability of design plans.

Maximum Water Depth at Substructure Inspected: Approximately 5.3 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the cap on the west end of Pier 2.

Water Surface: The waterline was approximately 10.8 feet below reference.
Assumed Waterline Elevation = 89.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code I/95

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

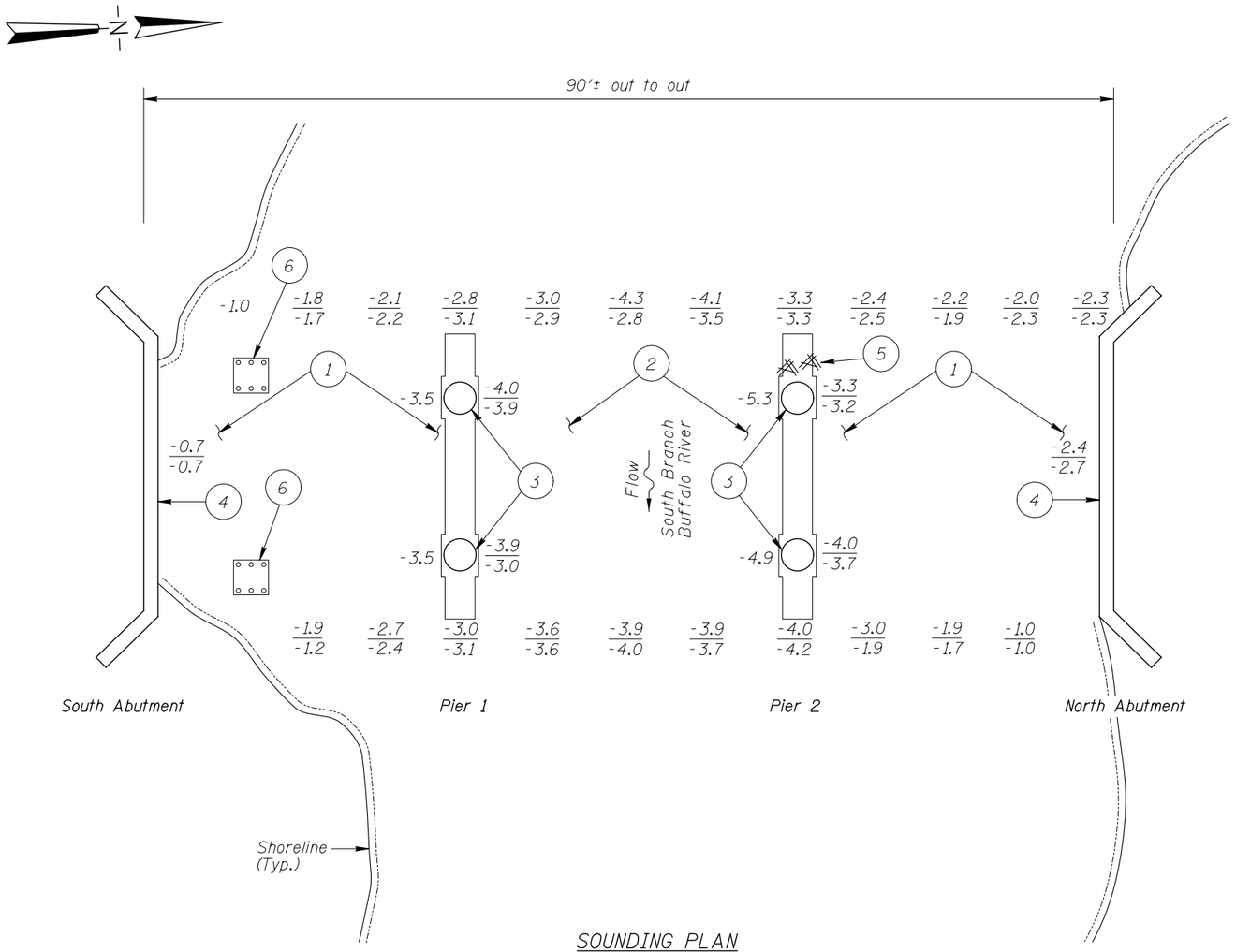
_____Yes X No

Photograph 1. View of Pier 1, Looking Northeast.

Photograph 2. View of Pier 2, Looking Southwest.

Photograph 3. View of South Abutment, Looking Southeast.

Photograph 4. View of North Abutment, Looking Northwest.



SOUNDING PLAN

GENERAL NOTES:

1. The North and South Abutments, and Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 21, 2007, the waterline was located approximately 10.8 feet below the top of the pier cap at the upstream end of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed the reference the waterline elevation was 89.2.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom between abutments and piers consisted of silt and random riprap up to 12 inches in diameter, with a maximum probe rod penetration of up to 2 feet.

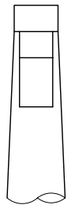
(2) The channel bottom in between the piers consisted of silty clay and riprap, up to 12 inches in diameter, with a maximum probe rod penetration of 2 inches.

(3) The concrete columns of Piers 1 and 2 were smooth and sound with random minor areas of poor consolidation with 1/4 inch maximum penetration.

(4) The concrete of the abutments was typically smooth and sound with minor vertical and diagonal cracks at random locations, ranging in width from hairline to 1/8 inch.

(5) A light accumulation of 6-inch-diameter and smaller branch timber debris was observed at the upstream side of the upstream column of Pier 2. The debris extended from the channel bottom to the waterline and was approximately 10 feet long (E/W) by 5 feet wide (N/S).

(6) Abandoned concrete columns (two total) were observed in the channel at 8 feet North of South Abutment. The columns were removed below the channel bottom; however, the rebar from the columns extended from the bottom up to 1 foot above the waterline.



TYPICAL END VIEW OF PIERS

Legend

-2.0	Sounding Depth (8/21/07)
-5.2	Sounding Depth (10/29/02)
	Timber Debris

Note:

All soundings based on 2007 waterline location.

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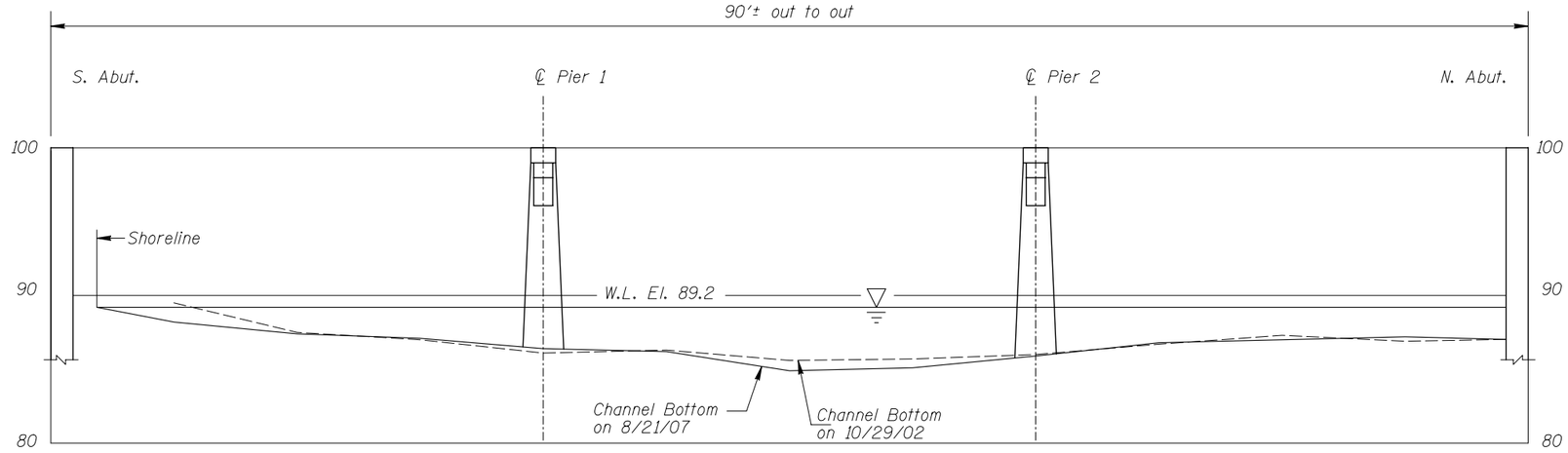
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

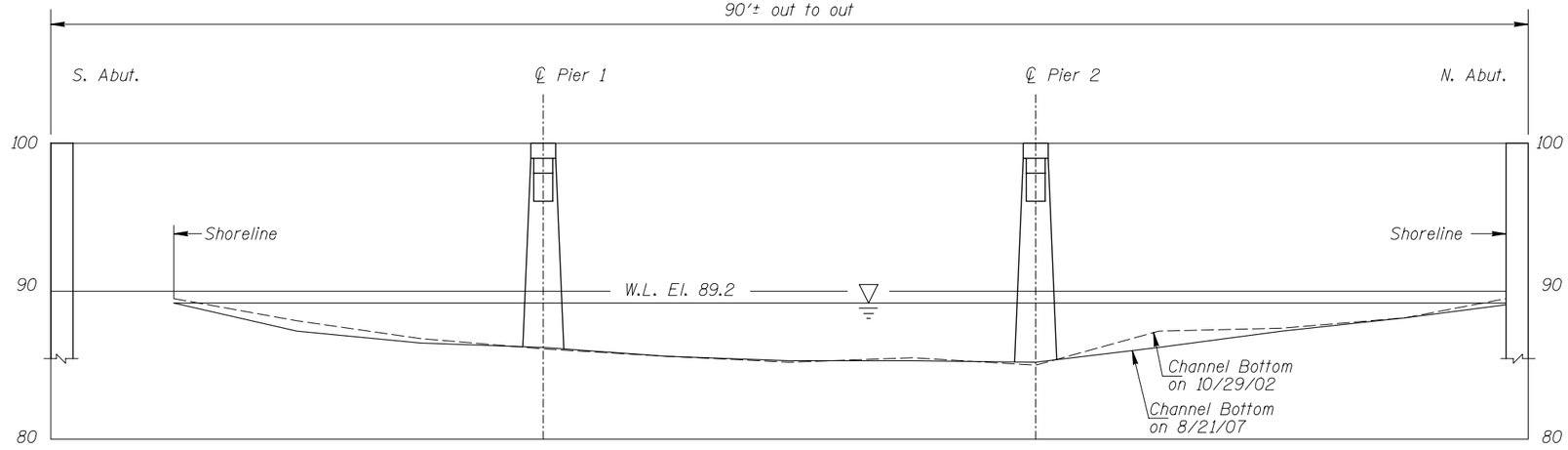
STRUCTURE NO. 5853
OVER THE SOUTH BRANCH OF THE BUFFALO RIVER
DISTRICT 4, CLAY COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210050		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=10'
Code: 52210050		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 21, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 5853 WEATHER: Cloudy, ± 70 ºf

WATERWAY CROSSED: The South Branch of the Buffalo River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: John Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 9:25 A.M.

TIME OUT OF WATER: 9:50 A.M.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY ± 1 foot

DEPTH 5.3 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2, North and South Abutments

REMARKS: Overall, the piers and abutments were in good condition with no defects of structural significance observed; however, minor hairline to 1/8 inch wide cracking was observed at the North and South Abutments. A light accumulation of branchy timber debris was observed at the upstream side of the upstream column at Pier 2. Abandoned concrete columns were observed in the channel at 8 foot north of south Abutment, the columns were removed below the channel bottom however the rebar extended from the bottom up to 1 foot above the waterline. The channel bottom appeared to be stable with no significant scour.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 5853
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler
WATERWAY CROSSED The South Branch of the Buffalo River

INSPECTION DATE August 21, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	South Abutment	0.7’	N	7	N	9	N	7	8	8	N	N	8	7	N	N	N	N	N
	Pier 1	4.0’	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N
	Pier 2	5.3’	N	7	N	9	N	7	8	N	N	7	7	7	N	N	N	N	N
	North Abutment	2.4’	N	7	N	9	N	7	8	8	N	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the piers and abutments were in good condition with no defects of structural significance observed; however, minor hairline to 1/8 inch wide cracking was observed at the North and South Abutments. A light accumulation of branchy timber debris was observed at the upstream side of the upstream column at Pier 2. Abandoned concrete columns were observed in the channel at 8 foot north of south Abutment, the columns were removed below the channel bottom however the rebar extended from the bottom up to 1 foot above the waterline. The channel bottom appeared to be stable with no significant scour.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.